

جمهورية مصر العربية



وزارة التربية والتعليم
والتعليم الفني

نموذج إجابة

امتحان شهادة إتمام الدراسة الثانوية العامة

للعام الدراسي ٢٠١٧/٢٠١٦ - الدور الأول

المادة : الديناميكا (باللغة الفرنسية)

نموذج



لكل مجرمة استلا فقد -
مراجع

| من : إلى | الدرج |
|----------|--------|
| ١ ← ٥ | ٧ |
| ٦ ← ٨ | ٦ |
| ٩ ← ١٢ | ٧ |
| ١٣ ← ١٦ | ٥ |
| ١٧ ← ١٨ | ٥ |
| المجموع | ٣٠ درج |

1-

(d) $2 \sqrt{r}$ 


2-

(b) 2 

3-


(i) $\therefore v = 6t - t^2$

$\therefore a = \frac{dv}{dt} = 6 - 2t$ 

quad $t = 2$; alors $a = 6 - 4 = 2 \text{ m/s}^2$ 

(ii) $D = \int v dt$

$D = \int (6t - t^2) dt$ 

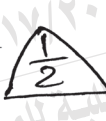
$= 3t^2 - \frac{1}{3}t^3 + C$ 

quad $t = 0$, $D = 0$

$0 = 0 - 0 + C \Rightarrow C = 0$ 

$D = 3t^2 - \frac{1}{3}t^3$

$D = 3 \times 2^2 - \frac{1}{3} \times 2^3$

$= 12 - \frac{8}{3} = \frac{28}{3} \text{ mètre}$ 
 $\approx 7,3 \text{ mètres}$

(ii) autre Solution $D = \int_0^2 (6t - t^2) dt = \left[3t^2 - \frac{t^3}{3} \right]_0^2 = 3 \times 2^2 - \frac{2^3}{3} = \frac{28}{3} \text{ m}$    

4-

(c) $30000 \text{ kg} \cdot \text{m} / \text{sec}$ 

5-

(b) $7,68$ 

6-

(c) accélération $1,2 \text{ m/sec}$ vers le haut Δ

7-

Première et dans l'air

$$V^2 = V_0^2 + 2gD$$

$$V^2 = 2 \times 9,8 \times 1,4 \Rightarrow V^2 = 27,44$$

D

Deuxième et dans le sable

$$V^2 = V_0^2 + 2aD$$

$$0 = 2 \times 9,8 \times 1,4 + 2 \times a \times 0,1$$

$$\therefore a = -137,2 \text{ m/sec}^2$$

$$Mg - T = Ma$$

$$9,8 \times 1 - 225 \times 9,8 = 11 \times (-137,2)$$

$$\therefore 1147 \text{ N} = 225 \times 9,8$$

$$M = 15 \text{ kg}$$

autre solution $E - E_0 = T$

$$MgD_1 + (Mg - T)D_2 = 0$$

$$Mg(D_1 + D_2) = TD_2$$

$$M = \frac{TD_2}{g(D_1 + D_2)} \Rightarrow M = \frac{225 \times 9,8 \times 0,1}{9,8 \times 1,5}$$

$$M = 15 \text{ kg}$$

8-

Premièrement $\therefore v = v_0 + at$

$$0 = 14,7 + \frac{3}{2}a$$

$$\therefore a = -9,8 \text{ m/sec}^2$$

$$\therefore R = mg \cos 30^\circ$$

$$- \mu R - mg \sin 30^\circ = ma$$

$$\therefore - \mu mg \cos 30^\circ - mg \sin 30^\circ = -9,8 m$$

$$- \frac{\sqrt{3}}{2} \mu - \frac{1}{2} = -1$$

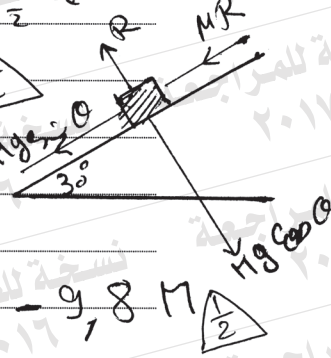
$$\mu = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

Deuxièmement $\therefore \tan \lambda = \frac{\sqrt{3}}{3}$

où λ est l'angle du frottement

$$\lambda = \theta = 30^\circ$$

\therefore le corps est sur le point de se mouvoir



9-

(d) 10^5 Newton Δ

10-

$$(a) m_1 g - T = m_1 a \quad \Delta \quad (1)$$

$$T - m_2 g = m_2 a \quad \Delta \quad (2)$$

par addition (1) et (2)

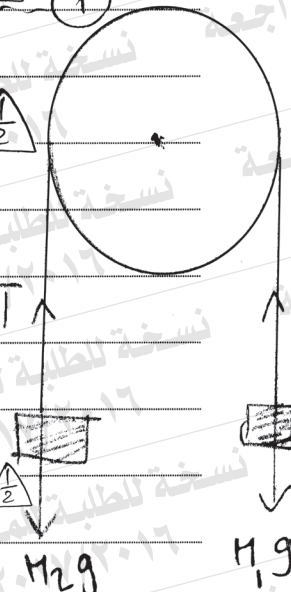
$$m_1 g - m_2 g = (m_1 + m_2) a \quad \Delta \quad (3)$$

$$980 (m_1 - m_2) = 196 (m_1 + m_2) \quad \Delta \quad (4)$$

$$5 m_1 - 5 m_2 = m_1 + m_2 \quad \Delta \quad (5)$$

$$4 m_1 = 6 m_2$$

$$m_1 : m_2 = 3 : 2 \quad \Delta$$



(b) $R = Mg$

$\therefore R = 500 \times 980$

$480g - T = 480a$ (1)

$T - MR = 500a$

$\therefore T - \frac{2}{5} \times 500 \times 980 = 500a$ (2)

par addition (1) et (2)

$480 \times 980 - 200 \times 980 = 980a$

$\therefore a = 280 \text{ cm/sec}^2$ (1/2)

de (1) $T = 480 \times 980 - 480 \times 280$
 $= 336000 \text{ dyne}$ (1/2)

$\therefore P = 2T \cos 45^\circ$ (1/2)

$= 2 \times 336000 \times \frac{\sqrt{2}}{2}$

$= 336000\sqrt{2} \text{ dyne}$

$= 3,36\sqrt{2} \text{ Newton}$ (1/2)

11-

$$(a) 45 \text{ m/s} \quad \triangle$$

12-

$$M_1 V_1 + M_2 V_2 = M_1 V_1' + M_2 V_2' \quad \triangle$$

$$100 \times 50 - 50 \times 30 = 100 \times V_1' + 50 \times 40$$

$$V_1' = 15 \text{ m/sec} \quad \triangle$$

$$\therefore I = M_2 (V_2' - V_2) \quad \triangle$$

$$= 50 (40 + 30)$$

$$= 3500 \text{ g} \cdot \text{m/sec} \quad \triangle$$

13-

$$(b) \quad 105 \quad \triangle$$

14-

$$(a) \quad \frac{1}{64} \quad \triangle$$

15-

$$(c) \quad 39 \quad \triangle$$

16-

$$\vec{D} = \vec{AB} = \vec{B} - \vec{A} \quad \triangle \frac{1}{2}$$

$$= (3; 4) - (-1; 2)$$

$$= (4; 2) \quad \triangle \frac{1}{2}$$

$$T = F \cdot D \quad \triangle \frac{1}{2}$$

$$= (6; -3) \cdot (4; 2)$$

$$= 24 - 6 = 18 \text{ Unité de travail} \quad \triangle \frac{1}{2}$$

17-

$$\therefore \text{La puissance} = f \cdot v \quad \left(\frac{1}{2}\right)$$

$$30 \times 75 = f \times 54 \times \frac{5}{18}$$

$$f = \frac{30 \times 75}{15} = 150 \text{ kgp} \quad \left(\frac{1}{2}\right)$$

\therefore La citerne uniforme

$$\therefore R = f = 150 \text{ kgp} \quad \left(\frac{1}{2}\right)$$

\therefore La résistance par charge tonne

$$= 150 : 6 = 25 \text{ kgp/tonne} \quad \left(\frac{1}{2}\right)$$

18-

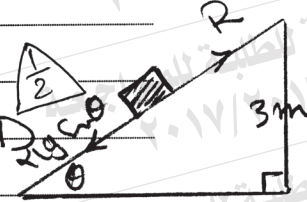
$$(a) \quad E - E_0 = T \quad \left(\frac{1}{2}\right)$$

$$\frac{1}{2} m v^2 - 0 = (m g \sin \theta - R) D \quad \left(\frac{1}{2}\right)$$

$$\frac{1}{2} \times 0,2 \times v^2 = 0,2 \times 9,8 \times \frac{3}{4} \times D - R D \quad \left(\frac{1}{2}\right)$$

$$\frac{1}{2} \times 0,2 \times v^2 = 0,6 \times 9,8 - 4,48 \quad \left(\frac{1}{2}\right)$$

$$v^2 = 14 \Rightarrow v = \sqrt{14} \text{ m/sec} \quad \left(\frac{1}{2}\right)$$



$$(b) \quad M_D = 130 \times \cos \theta$$

$$= 130 \times \frac{12}{13}$$

$$M_D = 120 \text{ N} \quad \left(\frac{1}{2}\right)$$

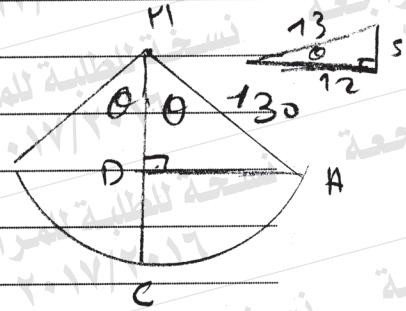
$$\therefore DC = 10 \text{ cm} \quad \left(\frac{1}{2}\right)$$

$$E_c + P_c = E_A + P_A \quad \left(\frac{1}{2}\right)$$

$$0 + \frac{1}{2} m v^2 = 0 + m g \times DC \quad \left(\frac{1}{2}\right)$$

$$\frac{1}{2} v^2 = 980 \times 10 \quad \left(\frac{1}{2}\right)$$

$$v = 140 \text{ cm/sec} \quad \left(\frac{1}{2}\right)$$



(انتهت الإجابة وتراعى الحلول الأخرى)